PART II. THE LEADING SUPPLIERS

CHAPTER 3. IMPERIAL CHEMICAL INDUSTRIES LIMITED

I. Growth and Development of I.C.I.'s Fertiliser Business

109. During the 1914–18 war, as a result of the U-boat blockade of natural nitrate from Chile, the Government sought a way of producing nitrates in this country by synthetic means. The Government's Munitions Inventions Department formed a Nitrogen Products Committee in 1916. The immediate object of this Committee was to produce nitric acid and ammonium nitrate for munitions; but at an early stage they noted that "with some foresight a plant erected primarily for a military purpose might be easily adapted in peace-time to agricultural objects". In 1917 the Ministry of Munitions purchased a large site at Billingham, on the north bank of the Tees, on which the necessary plant was to be erected. Construction work ceased, however, at the end of the war and the site remained virtually undeveloped.

110. By June, 1919, the Government had decided that although they did not wish to carry on with the work themselves, they wanted it to continue. Brunner Mond & Co. Ltd., who were alkali manufacturers in Cheshire, had taken an active interest in the early attempts to synthesise ammonia and had discovered and developed a new process for ammonium nitrate. On 24th June, 1919, the Government formally requested Brunner Mond & Co. Ltd. to take the lead in making the arrangements necessary for "the fixation of nitrogen by the Haber process* to be undertaken on an industrial scale by some combination capable of carrying out the work vigorously and without delay".

111. After attempts to form a syndicate of companies to acquire and develop the Billingham site had failed, Brunner Mond & Co. Ltd. undertook the task alone and in 1920 acquired the site from the Government. The purchase contract provided, inter alia, that the company would erect a factory at Billingham capable of making not less than 20 tons of ammonia per day and that it would erect, either at Billingham or elsewhere, plant to oxidise not less than 10 tons of ammonia per day to make nitric acid suitable for making explosives. It was intended that the company should produce nitrogenous fertilisers as well as nitric acid for explosives.

112. Brunner Mond & Co. Ltd. formed a subsidiary company, Synthetic Ammonia and Nitrates Ltd., for the purpose. By 1924 the Billingham factory was producing ammonium sulphate from ammonia of its own manufacture. In the same year steps were taken to develop the anhydrite deposits existing under the site, which have since become an important source of raw material for this process. Until this time, the only ammonium sulphate produced and marketed in the United Kingdom as a fertiliser had been made by the by-product producers of ammonia liquor. In 1920 the by-product producers had formed the British Sulphate of Ammonia

* Developed in Germany before the 1914–18 war.

Federation Ltd. (B.S.A.F.) to act as sole selling agent for its members. In 1923 Synthetic Ammonia and Nitrates Ltd. became a member of the B.S.A.F.; and since then the synthetic ammonium sulphate produced at Billingham and the sulphate made by the great majority of the by-product producers in the United Kingdom have been sold through the joint marketing arrangements of the B.S.A.F. We deal with the history and present organisation of the B.S.A.F. in paragraphs 151 to 165 below.

113. Research was meanwhile undertaken at Billingham with a view to competing with Chile nitrate by marketing a fertiliser made from ammonium nitrate and chalk which would have the advantages of providing nitrogen in both ammoniacal and nitrate forms and also lime. Nitric acid and ammonium nitrate were both made in February, 1927, and a powdered Nitro-Chalk, a mixture of ammonium nitrate and by-product chalk, in two strengths—15½ per cent. nitrogen and 10 per cent. nitrogen—in April, 1927. This mixture could not be made permanently homogeneous in powder form and a plant was built to make Nitro-Chalk containing 15½ per cent. nitrogen in granular form. The first plant, to make 100 tons a day, operated from January, 1929; output was increased to 250 tons a day in October, 1930.

114. In 1926 Imperial Chemical Industries Ltd. (I.C.I.) was formed from a merger of four British chemical companies—British Dyestuffs Corporation Ltd., Nobel Industries Ltd., United Alkali Co. Ltd. and Brunner Mond & Co. Ltd.; the latter carried Synthetic Ammonia and Nitrates Ltd. in with it, and also Nitram Ltd. which had been formed to act as sole selling agent for the ammonium sulphate produced by the members of the B.S.A.F. and for other fertilisers to be produced at Billingham. In 1931 Synthetic Ammonia and Nitrates Ltd. changed its name to I.C.I. (Fertilizer and Synthetic Products) Ltd. which eventually, in 1944, became the Billingham Division of I.C.I.

115. By the beginning of 1930 the effects of the world-wide trade depression were being felt and the new large plants at Billingham could not be kept fully occupied. This led to an intensification of research directed to the diversification of manufacture. I.C.I. has described the basic objective at Billingham as the production of hydrogen and the reaction of this hydrogen to make saleable products. Thus hydrogen is reacted with nitrogen to produce a range of fertilisers and industrial nitrogen products; with carbon monoxide to give methanol; and with heavy molecular weight hydro-carbons to give petrol. As a result of these developments the production of fertilisers was integrated with the manufacture of other products, capacity for production of ammonium sulphate, which had been as high as 700,000 tons in 1930, had fallen to half that figure by 1939. Actual output, however, was well below capacity in 1930 and later (see paragraph 117).

116. In the meantime work had been undertaken by I.C.I. on the formulation of compound fertilisers to contain the three essential plant foods, nitrogen, phosphorus and potash. I.C.I.'s first Concentrated Complete Fertiliser (C.C.F.) came on to the market for the 1931 season; it was in a granulated form to prevent separation of the constituents and allow ease of handling. Subsequently, different products were made to serve different purposes, until the range embraced nine varieties of C.C.F. as well as a number of other

compounds. C.C.F. was a more concentrated fertiliser than other manufacturers were marketing. I.C.I. has explained that there were considerable commercial as well as manufacturing difficulties to be overcome. Many farmers were accustomed to buying their compound fertilisers from small local firms, who made up special mixtures for local soils and crops, and they were not easily persuaded that the advantage of having to apply a smaller quantity per acre compensated for the loss of a "tailor-made" mixture. I.C.I. says that as a result of the difficulties, both technical and commercial, the capital expenditure on the C.C.F. plant was much more than was originally intended and for several years there was an annual loss on the trading accounts.

117. In 1931, when the full effects of the depression were being felt in agriculture throughout the world and, consequently, in the nitrogen fertiliser trade, it was estimated that a total of £25 million was invested in the Billingham project, of which about £15 million was in respect of plant for fertilisers and associated services. Of the balance, about £5 million had been spent on plants for industrial products, and the remaining £5 million on houses, plants not in production, etc. During 1931 and for the five following years about 60 per cent. of all this fertiliser and associated plant was idle. Output of ammonium sulphate at Billingham, which had reached 456,000 tons in 1929, fell to 276,000 tons in 1934 and to 142,000 tons in 1936.

118. In the later 1930s trade began to improve and from 1939 and throughout the war demand for Billingham products was high. The petrol plant was run to produce aviation spirit from creosote; the ammonia made was used for fertilisers and industrial products under the direction of the Ministry of Supply. Difficulties in procuring phosphate rock and potash salts interfered with the production of compounds and it was eventually decided to make one mixture only—a C.C.F. containing 12 per cent. N, 12 per cent. P_2O_5 and 15 per cent. K_2O. (I.C.I. has not since then reverted to the policy of marketing more than one C.C.F. In 1957 the K_2O content was raised to 18 per cent.)

The Nitrogen Cartel

119. During the 1920s there had been considerable construction of synthetic nitrogen capacity abroad, often with financial assistance from Governments for military purposes, and this, with the subsequent world-wide decline in the prosperity of agriculture, led to an excess of output over demand and a fall in prices. I.C.I. says that it was to meet this situation, in which the Billingham venture was threatened with disaster, that, in June, 1929, the company and the German I.G. Farbenindustrie signed an agreement for 10 years to promote an increase in demand for nitrogenous fertilisers and to regulate production, sales and prices. I.G. brought Norwegian capacity into the agreement through its special relationship with a Norwegian company and I.C.I., in effect, brought in the capacity of the by-product producer members of the B.S.A.F. (see paragraph 112). These arrangements were extended in the same month by an agreement between I.C.I. and the Chilean Government under which Chile agreed to co-ordinate its price policy with I.C.I.'s for the 1929–30 fertiliser year.

120. The first European nitrogen cartel, known as the Convention Internationale de l'Azote, was formed in the summer of 1930, its members

being producers in the United Kingdom, Belgium, Czechoslovakia, France, Germany, Holland, Italy, Norway and Poland: the agreement was made for one year and it included an arrangement with the Chile nitrate producers. Among its purposes were the increase in world nitrogen consumption, the maintenance of prices and the allocation of business by percentage quotas, with provision for reduction of prices where necessary to enable any of the parties to sell to the extent of their quotas.

121. I.C.I. has said that by 1930–31 more than half the synthetic nitrogen capacity in the world was idle. Efforts were made in 1931 to find a permanent basis for co-operation among the European producers and with Chile but these failed. In many European countries which were nitrogen producers as well as consumers the Governments raised tariff barriers, while in the free markets there was a further fall in prices of about 50 per cent. In April, 1932, the United Kingdom, as part of the general change in tariff policy, imposed a duty of 20 per cent. on imports of nitrogenous fertilisers. (In 1935 this was replaced by a specific duty of £4 per ton, which applied to a range of nitrogen products, including ammonium sulphate.)

122. In the early summer of 1932 negotiations to re-form the European cartel were successful and the co-operation of Chile was obtained. The arrangements were continued annually until 1934–35. In that year a definite agreement was made with Chile, and a further cartel agreement was made for 1935–36 which remained in operation until June, 1938, when new agreements were signed to start from 1st July, 1938. This cartel operated until all agreements came to an end with the outbreak of war in September, 1939. I.C.I. says that all these international agreements were known to the British Government.

123. I.C.I. has told us that world consumption of fertiliser nitrogen increased nearly threefold between the 1914–18 war and the 1929–30 season. In this latter year export shipments of ammonium sulphate from the United Kingdom amounted to 627,000 tons. World consumption of nitrogen fell somewhat in the early 1930s, but by 1938–39 it was nearly 50 per cent. higher than in 1929–30. Shipments from the United Kingdom fell more sharply and did not recover to the same extent; in 1938–39 they amounted to just over 300,000 tons. At the same time, however, I.C.I. on behalf of the B.S.A.F. was buying considerable quantities of sulphate in Europe for sale in export markets. These transactions reached their highest level in 1934–35, when 250,000 tons were handled in this way; in 1938–39 the figure was about 100,000 tons. The transactions, which took place in a period when Billingham was operating below capacity, were a result of the quota arrangements of the cartel which were based on production capacity. I.C.I. says that it could not have met this demand from home production while conforming with the quota arrangements and that by participating in the transactions it was maintaining its selling organisation in the overseas markets and at the same time assisting the foreign producers to fulfil their quotas.

Relations with other United Kingdom fertiliser manufacturers

124. In spite of trading conditions during the 1930s, I.C.I.'s activities were becoming of increasing importance to manufacturers of compound fertilisers. In the first place, as the largest producer of ammonium sulphate and as the

B.S.A.F.'s agent for the sale of most of the rest of the output in the United Kingdom, the company effectively controlled the supply and price of one of their essential materials. Secondly, in view of the company's ability to market compounds of greater concentration than any other manufacturer had produced at prices which were lower, per unit of nutrient content, than any other manufacturer's, and having regard also to the company's great technical and financial resources, it was now regarded as a formidable competitor in the field of compounds. Thirdly, in 1928, I.C.I. had formed a subsidiary company, Scottish Agricultural Industries Ltd. (S.A.I.), which by amalgamating a number of manufacturing and merchanting businesses had become the dominant producer and distributor of fertilisers in Scotland (see paragraphs 142–150). Nevertheless, the trading situation during most of the 1930s was such that none of the parties wanted unrestricted competition; the arrangements which were made between I.C.I. and the F.M.A. and the breakdown over Fisons' decision (with West Norfolk) to start making synthetic ammonium sulphate are described in paragraphs 195 to 198.

I.C.I. and the building of Government plants

125. From 1936 to 1943 I.C.I. was closely concerned with the design and construction on behalf of the Government of a number of ammonia and fertiliser plants, most of which became available after the war for commercial production. Starting in 1936 there were discussions between the Government and I.C.I. about war-time requirements of nitrogen, and before and during the war a number of plants were built and subsequently managed by I.C.I. on behalf of the Government. These included an ammonia plant at Mossend near Glasgow, built in 1938, and one at Dowlais for producing ammonia and methanol.

126. During 1940 the provision which had been made for nitrogen for explosives seemed to be adequate but it was becoming evident that the war-time demand for fertilisers was liable to outrun supplies. In June, 1941, I.C.I. began the construction on behalf of the Ministry of Supply of a factory at Prudhoe on the river Tyne to make 40,000 tons per year of ammonia for conversion to 150,000 tons per year of ammonium sulphate; production at this factory started in December, 1942. At Heysham a plant had been constructed by the joint efforts of I.C.I. and two other companies for the manufacture of aviation fuel by the hydrogenation of gas oil. During 1941 part of this plant was modified to make 40,000 tons a year of ammonia. Plans were made to build nitric acid and ammonium nitrate plants on an adjacent site at Middleton and more plant was installed at Mossend.

127. During the whole of this period, in addition to the work of design and construction, I.C.I. provided starting-up teams and key men both for the completely new factories and also for nitric acid and other plants which I.C.I. had designed and installed at Government explosives factories. Under the arrangements by which I.C.I. built the factories the company received construction fees. Subsequently, as the managing agent for the Government, the company was paid a fee of ½ per cent. per annum on the capital cost of the factories. I.C.I.'s know-how about the relevant processes for running the plants was made available to the Government without other payment.

128. I.C.I. continued to run these factories as agent for the Government after the war had ended. In 1948 the Government decided to sell some of them and on 31st December, 1948, I.C.I. purchased the whole of the Dowlais factory and certain parts of the factory at Heysham. On 6th February, 1950, I.C.I. bought from the Government the ammonium nitrate factory at Middleton. Part of the ammonium nitrate continued to be sold as such for a time, but new plant was built by I.C.I. to turn the ammonium nitrate into 15·5 per cent. Nitro-Chalk, using purchased limestone in the process. This new Nitro-Chalk plant came into production in the spring of 1952 and I.C.I. says that for the next three fertiliser years more Nitro-Chalk was available than was required by United Kingdom farmers. Small quantities were exported, but since the world demand was for ammonium sulphate rather than for Nitro-Chalk it was decided to use the available ammonia supply for the production of sulphate, once this country's requirements of Nitro-Chalk had been satisfied.

129. When the Prudhoe ammonium sulphate factory came into production in 1942 it was agreed that although the Ministry of Supply would not actually become a member of the British Sulphate of Ammonia Federation the output should be sold by I.C.I. as if the Ministry were a member. I.C.I. continued to run Prudhoe as agent for the Government until November, 1954. During this period production capacity both for ammonia and for ammonium sulphate was increased. The agreements covering the construction of the factory provided that if the Minister of Supply decided within 20 years to sell or lease it he had to offer it first to I.C.I., indicating the assets and the terms he was prepared to accept for them. In November, 1954, the Government sold the factory to I.C.I., by which time, with the help of ammonia from other factories, it was capable of producing 300,000 tons per year of ammonium sulphate.

War and post-war controls

130. Apart from the effects of I.C.I.'s involvement in the building and management of Government factories and eventual purchase of a number of them, the development of the company's fertiliser business was considerably affected by war-time and post-war conditions. The various Government controls included the following:—

(*a*) Exports of ammonium sulphate were restricted throughout the war period, all forms of fertiliser nitrogen being subject to export licence and, in the latter part of the war, to allocation by the International Emergency Food Committee in Washington. The export licensing of ammonium sulphate came to an end as from 1st December, 1958.

(*b*) Phosphate rock, ammonium phosphate and certain other fertiliser materials were imported on Government account.

(*c*) There was statutory price control in force up to 30th June, 1953, under which maximum selling prices were fixed each year for all the important fertilisers. Prices were stabilised early in the war, and up to 30th June, 1951, subsidies were paid to fertiliser manufacturers to compensate for rising costs (see paragraph 68).

131. Subsidies to manufacturers were removed in two stages in 1950 and 1951 and later direct subsidies to farmers were substituted. The subsidy

for nitrogen was introduced during 1952 (see paragraph 31). These processes had, we are informed, an unsettling effect on the market for nitrogen fertilisers during these years; there were periods when customers held off buying and stocks accumulated, and there was one period in 1952 when production of ammonium sulphate had to be restricted having regard to the company's commitment to the B.S.A.F. to give priority to the disposal of by-product sulphate (see paragraph 159). The subsidy, which was related to the nitrogen content (see Appendix 3), amounted to £3 3s. 0d. per ton of ammonium sulphate in 1952 but is now £9 18s. 0d. per ton, the unsubsidised price of sulphate (on sale to the farmer without seasonal or other allowance) being £16 10s. 0d. in 1952 and £21 5s. 0d. today.

132. Government controls of production, procurement and prices were abandoned in 1952–53, but by agreement between I.C.I. and the Ministry of Materials the prices of ammonium sulphate, Nitro-Chalk and C.C.F. continued to be determined until 30th June, 1955 as if price control had continued.

Other post-war developments

133. Since the war there have been considerable developments in compound fertilisers. Compounds would no doubt have benefited proportionately, in any case, from the general increase in the use of fertilisers, stimulated, as it has been, by the Government's subsidy policy and by official and other propaganda; but, in fact, the consumption of compounds has increased more rapidly than that of fertilisers in straight form. At the same time there has been a continuous increase in the concentration and improvement in the quality of compounds. Before the war I.C.I.'s C.C.F. was in a class by itself as a granular compound of high concentration, but during and after the war other compounders installed granulation plants and gradually increased the concentration of their fertilisers. I.C.I. was concerned with these developments, first as a manufacturer and, by its arrangement with the B.S.A.F., virtually the sole supplier of the principal nitrogen-containing element in compounds, and secondly as a manufacturer of compounds. While price control continued the question of the price at which ammonium sulphate was sold to compounders was to some extent dormant, but with the removal of control Fisons, in particular, began to press for improved terms. The changes in the pricing system for sulphate which I.C.I. subsequently made are described in Chapter 7 and Fisons' reactions to what that company regarded as the unsatisfactory response of I.C.I. in Chapter 4.

134. Apart from questions of price, the increasing home demand for nitrogen fertilisers has, naturally, created production problems. In I.C.I.'s opinion the extent of this increase was not foreseeable at the end of the war, or indeed, from year to year thereafter. Moreover, for a number of years there were difficulties with some raw materials. In 1952 I.C.I. informed the Government that because of its doubts about demand, the shortage of capital and the high cost of the manufacturing processes, the capital required for further expansion of production of nitrogen fertilisers was greater than the company considered itself justified in spending in those conditions; I.C.I. offered the Government its full technical assistance, however, if they should decide that capacity ought to be increased. In

1953 the Government Departments concerned told I.C.I. that, having regard to the plant in course of erection at Billingham to provide an additional 36,000 tons of nitrogen per annum (the greater part in the form of ammonia), there was no urgency for new nitrogen capacity and the Government would not itself expand the Prudhoe plant, which it still owned. Nevertheless I.C.I. came to the conclusion soon afterwards that demand would be greater than had been foreseen up to then and in 1955 authorised new plant for Billingham, based on an oil gasification process, to produce a further 50,000 tons of nitrogen per annum. Subsequently, the C.C.F. plant at Billingham was extended, the manufacture of a new nitrogen and potash fertiliser, Kaynitro, was undertaken and the plant at Heysham was extended and adapted to produce Nitro-Chalk of higher concentration. I.C.I. also gave S.A.I. full technical support when the latter decided on the production of concentrated compounds based on ammonium phosphate (see paragraph 147).

135. During a great part of this post-war period, the export market for ammonium sulphate has been a seller's market; demand was high at prices above those ruling at home. I.C.I. was required by the Government to give priority to satisfying home demand. The company has not always been able to meet export demand from home production—whether its own or that of the by-product producers—and has from time to time bought considerable quantities abroad for re-sale abroad; as distinct from the practice before the war (see paragraph 123) there was no idle capacity in this country at the time and it was not done under the terms of any market-sharing agreement with overseas manufacturers.

136. In 1953, I.C.I. became a founder member of the Centre d'Etude de l'Azote, a body set up at Geneva by the West European nitrogen producers to collect data about the use of nitrogen, study agricultural conditions in different parts of the world and publish works on crop production.

137. Fisons and Shell Chemical Co. Ltd. are now entering the field of nitrogen production on a considerable scale; I.C.I.'s Nitro-Chalk and C.C.F. will be faced with more vigorous competition than has existed before, while the demand for ammonium sulphate may also be affected by these developments. The history of the relations between I.C.I. and Fisons since the war, which has some bearing on this, is dealt with in paragraphs 199 to 212.

II. Present Organisation of I.C.I.

138. I.C.I.'s manufacturing interests in the United Kingdom are organised in a number of Divisions, each of which is responsible for the manufacture and sale of a group of related production. The Divisions operate over 100 works in the United Kingdom making 12,000 different products. Though they vary considerably in size, even the smallest Division is a substantial enterprise.

139. In 1957 the then Billingham Division was split into two Divisions: one, which continues to be called the Billingham Division, deals primarily with ammonia and fertiliser products and the other—the Heavy Organic Chemicals Division—deals with organic products derived in the first instance from the oil crackers at the company's Wilton Works. Fertilisers account

for approximately half the turnover of the Billingham Division and about 10 per cent. of I.C.I.'s home sales.

140. The management of the Division is in the hands of a Division Board, which has full powers to carry on the Division's business within the framework of the general and financial policy laid down by the Main Board of the company. One Director on the Main Board, who is not a member of the Billingham Division Board, acts as a permanent link between the Main Board and the Billingham Division, while the guidance of other Main Board Directors may be given from time to time.

141. The co-ordination of the company's agricultural activities (in the technical sense) is the concern of a separate organisation, Central Agricultural Control (C.A.C.). C.A.C. pursues research and development, and provides an information service for the farming community, reporting new developments in agriculture and the latest techniques.

III. Scottish Agricultural Industries Limited

142. One associated and three subsidiary companies of I.C.I. are engaged in the United Kingdom in the production or supply of fertilisers named in the reference, but with the exception of Scottish Agricultural Industries Ltd. (S.A.I.) their fertiliser interests are negligible.

143. In 1928, on the initiative of I.C.I., Scottish Agricultural Industries Ltd. was incorporated to acquire the share capital of six leading Scottish companies engaged in the fertilisers and feeding stuffs trade: since its formation S.A.I. has been the dominant supplier of fertilisers in Scotland. I.C.I. owns directly 57·70 per cent. (1,669,052 shares) and through a wholly owned subsidiary 4·84 per cent. (140,000 shares) of the 2,892,400 ordinary shares of S.A.I. in issue.

144. At the outset S.A.I. was purely a holding company. As some of the 6 merging companies controlled a number of smaller companies, the group originally included 17 companies, of which 13 were 100 per cent. subsidiaries and 4 were companies in which S.A.I. had a controlling interest; but many changes have since taken place in the structure of the group by way of consolidation of subsidiary companies and branch businesses, by acquisition of minority interests, by liquidation and by disposals. Between 1936 and 1947 controlling interests were acquired in 13 more businesses engaged in agricultural merchanting, the implements or seeds trade, or the manufacture of compound fertilisers or animal feeding stuffs, "in order to provide a retail trading organisation in each of the main agricultural districts of Scotland and to enable the company to offer a more complete range of goods and services in each of these districts". S.A.I. now controls 7 companies of which 4 are 100 per cent. subsidiaries and 3 are companies in which S.A.I. has a controlling interest. However, only 3 of the subsidiaries are engaged in the fertiliser trade and since 1943 nearly all the trading and manufacturing activities of the group have been carried on by S.A.I. itself.

145. S.A.I. and its subsidiaries supply a wide range of products primarily associated with the agricultural industry, e.g. fertilisers, animal feeding stuffs and farm produce. Of the fertilisers listed in the reference S.A.I. produces calcium superphosphate (single), ground rock phosphate, basic

slag and compound fertilisers. It imports, or purchases imported supplies of, sodium nitrate, potassium chloride, kainite, potassium sulphate and basic slag, and occasionally other fertilisers. It also merchants fertilisers made by other United Kingdom manufacturers, principally I.C.I. (see paragraph 146). The company supplies approximately one-sixth of the total tonnage of superphosphate in the United Kingdom, as well as producing its own requirements of single superphosphate and ammonium phosphate for the manufacture of its compound fertilisers. It also supplies rather less than 30 per cent. of the total tonnage of ground rock phosphate, about one-seventh of the total tonnage of basic slag, and about one-tenth of the total tonnage of compounds. In the year ended 30th September, 1955, sales of the fertilisers listed in the reference represented approximately 35 per cent. by value of S.A.I.'s total sales, which amounted to £23·2 million and were all in the United Kingdom. (Similar figures for later years have not been obtained.) S.A.I.'s sales of fertilisers covered by the reference in the year 1957–58 amounted to more than 500,000 tons.

146. As an agricultural merchanting house the company provides the full range of supplies of farmers' requisites and services (including the marketing of farmers' grain, hay and straw) customarily provided by corn and agricultural merchants in the United Kingdom. The company owns many local stores. About three-quarters of its sales of fertilisers are made direct to farmers, the rest going to merchants, co-operative societies and compounders. Such activities have been carried on continuously since the formation of the company. As the agent of I.C.I. in Scotland, the company markets ammonium sulphate and other products of I.C.I. for use in agriculture and horticulture (with the exception, since 1957–58, of C.C.F.). S.A.I.'s trading activities also include crop spraying and other services and the supply of sulphuric acid to other superphosphate manufacturers.

147. During 1943–44 S.A.I. decided to adopt the granulation process for the production of its compound fertilisers. Within the next three years it installed granulation plants at its six main factories (Dyce and Sandilands at Aberdeen, Carnoustie, Leith, Ayr and Glasgow) of sufficient combined capacity to produce its full requirements of compound fertilisers in granular instead of powder form. In 1946–47 a comprehensive programme of reconstruction and modernisation of fertiliser works was inaugurated. After study of the economic advantages and disadvantages of the alternatives it was decided that single superphosphate should remain the basis of the company's production of phosphatic fertilisers and that the ultimate objective would be to concentrate the production of superphosphate and compounds into three centres. This programme was only partly carried out—at Aberdeen and Ayr—for in 1953 it was decided, after further study of the economic aspects, to undertake the production of concentrated complete fertilisers based on ammonium phosphate at Leith and to abandon there the manufacture of superphosphate and compounds based thereon. The reconstructed Leith works came into production in July, 1957.

148. The company has taken part in certain arrangements, including, from 1947 to 1953, a market-sharing agreement with Fisons and R. & J. Garroway Ltd. in Scotland relating to fertilisers derived from phosphate rock. The main effect was to establish sales quotas of 75 per cent., 16 per cent. and 9 per cent. for S.A.I., Fisons and Garroways respectively, though

we are informed that these were not implemented. It was also provided, inter alia, that the parties would endeavour to eliminate unnecessary price competition and would not purchase "a business involving a major outlet for any other party" without prior consultation. It was also envisaged that some market-sharing arrangement should be made between S.A.I. and Fisons for the northern counties of England, but this was never implemented. The agreement was the successor to agreements relating to single superphosphate which had existed from 1932 to 1940 between S.A.I. and Garroways and between S.A.I. and Thomas Ovens and which included price arrangements; Ovens had been acquired by Fisons in 1944. S.A.I. says that these original agreements relating to single superphosphate were entered into at a time of strong Continental competition and acute unemployment in the Scottish superphosphate industry.

149. Agreements were entered into in 1947 with two Farmers' Co-operative Societies in the south of Scotland under which they undertook to confine their fertiliser activities, as hitherto, to selling and distribution and not to engage in compound manufacture, and to draw their supplies of ammonium sulphate, Nitro-Chalk, compounds, single superphosphate and ground rock phosphate from S.A.I. for a period of ten years in return for special terms on these supplies. The terms included a deferred rebate related to the tonnage delivered. The deferred rebate arrangement was extended to a third society and the tonnages of the three were combined for the purpose of determining the rate payable to each. The agreements, which no longer operate, included a resale price maintenance clause.

150. In 1956, as the result of an approach from the Scottish Co-operative Wholesale Society Ltd. (S.C.W.S.), S.A.I. purchased the plant and machinery used by the Society for the manufacture of granular compounds and took over the lease of its factory. An agreement was made by which S.A.I. undertook to supply and S.C.W.S. to purchase from S.A.I. its total requirements of granular compounds (with certain exceptions) and of superphosphate and ground rock phosphate for a period of five years. While the S.C.W.S. continued to manufacture powdered compound fertilisers after 1956, there was an informal understanding that the Society would not engage in the manufacture of granular compounds during that period. This agreement is still in operation.

IV. The British Sulphate of Ammonia Federation Limited

151. We have mentioned in paragraph 112 that I.C.I.'s predecessor became a member of the B.S.A.F. in 1923 and we have referred from time to time to the nature of the relations between I.C.I. and the by-product members. I.C.I.'s activities in connection with ammonium sulphate are so bound up with those relations that we think it necessary to explain them fully.

History

152. In the early part of the present century there were about 400 separate undertakings producing by-product ammonium sulphate, the bulk of the material being exported through merchants. The rate of production of ammonia was dependent on the rate of production of coke from coke ovens and gas works, and this in turn depended on the rate of activity of the iron

and steel industry and the domestic gas industry. The only substantial demand for the by-product ammonium sulphate was in agriculture and here the demand was seasonal. The producers had little storage capacity and the generally unsatisfactory conditions of marketing led to the formation of the Sulphate of Ammonia Association in 1914. Its functions were to encourage the use of ammonium sulphate in the home market and to keep in touch with the market situation.

153. During the 1914–18 war the services of the Association were used by Government Departments and its organisation was expanded to meet the large increase in home demand. By 1919 the leading producers were convinced of the merits of a central selling organisation and to meet these circumstances the British Sulphate of Ammonia Federation Limited was formed in 1920 to replace the existing association and to act as sole selling agent for all its members. From the early days of the B.S.A.F. there was close co-operation between the by-product industry and Brunner Mond & Co. Ltd.; as we have mentioned, Synthetic Ammonia and Nitrates Ltd. joined the B.S.A.F. in 1923, and in 1926 Brunner Mond & Co. Ltd. formed Nitram Ltd., which in December of that year was appointed sole selling agent at home and abroad on a non-profit-making basis for the ammonium sulphate produced by members of the Federation and for other fertilisers to be produced at Billingham (see paragraphs 112 and 114). The arrangement was embodied in an agreement dated 31st March, 1928, between the B.S.A.F., Nitram Ltd. and I.C.I. (which had then taken over Brunner Mond & Co. Ltd.). Later it was decided to wind up Nitram Ltd. and the agency was transferred to I.C.I., still on a non-profit-making basis, on 1st January, 1930. In 1931, a new agreement was made between the B.S.A.F. and I.C.I. to last for 15 years, I.C.I. undertaking, inter alia, to remain a member for the duration of the agreement.

154. To a considerable extent the trading conditions encountered by the B.S.A.F. in the 1930s and during and since the war have been described in dealing with I.C.I., but there are one or two further matters which should be mentioned. By 1935, the B.S.A.F. felt that competition from outside by-product producers was a serious menace, annual home sales of ammonium sulphate by non-members being estimated at 50,000 tons or about a quarter of all home sales. As a result the B.S.A.F., on 18th July, 1935, decided (*a*) that the scale of home prices for the current season should not be published, (*b*) to notify the principal non-members that the Federation would actively compete with them for all business in the home market, and (*c*) to request Federation members not to enter into any new arrangements for the sale of ammoniacal liquor to non-members. About the same time, however, the principal non-members were invited to join a scheme under which, without joining the Federation, they could co-operate instead of competing with the members. Export prices had at times fallen below home prices and a scheme was devised to reduce the temptation on the part of members to secede from the Federation in the hope of selling their whole production at home and to stop price cutting by non-members. Under the scheme the Federation offered to purchase from a non-member, at a price equal to the average price realised by the Federation for home and export sales, any surplus sulphate which he was unable to sell, in return for an undertaking by the non-member to observe the Federation's

home prices and conditions of sale. By the end of 1936 about half the non-members, accounting for three-quarters of non-member production, had joined a scheme on these lines.

155. The application of a specific import duty of £4 per ton on nitrogenous fertilisers in 1935 affected the B.S.A.F.'s pricing arrangements, since the Federation (and I.C.I.) undertook not to alter the prices of their fertilisers unless the costs for certain specified items were increased or decreased. Any variations had to be approved by the Import Duties Advisory Committee of the Board of Trade. Apart from a modification in detail in July, 1938, this undertaking remained in force until the outbreak of war, when fertiliser prices became subject to statutory control.

156. In November, 1939, the B.S.A.F. introduced a scheme called the Sulphate of Ammonia Export Realisation Equalisation Scheme for the benefit of both members and non-members. The arrangement was a means of pooling export realisations and enabled producers outside the Federation to share in realisations from export sales whether or not these outside producers had made any export sales themselves—a principle which was already being applied within the Federation. During the period when the scheme was in operation (1st November, 1939 to 30th June, 1954) realisations per ton from export sales were higher than those from home market sales.

157. On 1st July, 1951, a Home Price Equalisation Scheme was introduced by the Federation and also made available to members and non-members. Under this arrangement part of the realisations from I.C.I.'s home sales of synthetic ammonium sulphate (including sales on behalf of the Government—see below) was distributed to other producers of ammonium sulphate both inside and outside the Federation. The scheme was, in effect, a necessary corollary of price control if synthetic and by-product ammonium sulphate were to continue to be sold at the same price, and it was operated with the knowledge and approval of the Government (see paragraph 77). It was terminated for non-members on 30th June, 1954, but continued as between I.C.I. and the by-product members until 30th June, 1955. Most of the ammonium sulphate producers outside the Federation participated in both schemes. When the Government factory for the production of synthetic ammonium sulphate at Prudhoe came into production under I.C.I.'s management in 1942 (see paragraph 126) it was agreed that although the Ministry of Supply would not actually become a member of the B.S.A.F. the output should be sold by I.C.I. as if it were a member. For the purposes of the Home Price Equalisation Scheme, therefore, the Government as well as I.C.I. contributed to the fund which was shared among the by-product producers.

Present organisation of B.S.A.F.

158. Each producer member of the B.S.A.F. has entered into an agreement with the Federation under which he sells the ammonium sulphate he produces through the agency of the Federation which, in turn, sells through the sub-agency of I.C.I., the only member producing synthetic sulphate. The agreements are in common form, known as the B.S.A.F./Seller's Agreement, except that I.C.I.'s Seller's Agreement with the Federation is in slightly different form though with similar effect. There is also an agency agreement

between I.C.I. and the B.S.A.F. The original agency agreement made in 1931 (see paragraph 153) was succeeded in 1946 by the current agreement which is expressed to remain in force until 1970.

159. The principal effects of this group of agreements are that (1) ammonium sulphate produced by the members is sold in the United Kingdom at common prices and terms, as agreed by the B.S.A.F. on the recommendation of I.C.I., (2) the sales realisations of both home and export sales are pooled and the net proceeds distributed to the members pro rata to their production, (3) I.C.I. is responsible for developing the market and for keeping the transport, storage and other charges to a minimum, (4) I.C.I., having regard to the limited storage facilities of other members and to prevent over-stocking, undertakes to give priority to the disposal of by-product sulphate in preference to its own as and when necessity arises.* For its agency services I.C.I. is allowed a percentage commission on all sales of B.S.A.F. sulphate. The figure has varied from time to time, the intention being, we are informed, that in the long term I.C.I. should neither make a profit nor incur a loss in its capacity as agent.†

160. The Federation says that from its formation it has encouraged its members to maintain a high standard of quality, as regards both nitrogen content and physical properties. For many years it had operated a system of allowances and deductions for the production of ammonium sulphate that deviated from specified standards, the most important of which was for nitrogen content, and in 1939 it introduced an additional allowance for sulphate of a certain physical condition.

161. Apart from the research it undertakes itself (see paragraph 169), the Federation has been assisted by research work undertaken by I.C.I. for the improvement of the by-product salt, and certain patents obtained by I.C.I. were placed at the disposal of Federation members free of cost.

162. The Federation says that its principal functions were and still are:

(1) to take regular delivery of and to sell the production of its members,

(2) to obtain the best possible prices for its members' production consistent with conditions in the nitrogen market,

(3) to encourage its members to maintain the highest possible standard of quality of their product and also to maintain continuous production, and

(4) to expand the market for ammonium sulphate with due regard to the findings of agricultural research stations at home and abroad.

163. Membership of the Federation is open to producers of ammonium sulphate in the United Kingdom and Commonwealth, but there are now

* This last provision was not in the agency agreement of 1931 but was introduced into the 1946 agreement. We are informed that an understanding to the same effect existed before 1946.

† We are informed that from January, 1930 to June, 1946 I.C.I. incurred losses on a commission of 4 per cent. The commission was raised to 5 per cent. in 1946. We have no information on the position up to 1950–51, but in each of the four years to June, 1955 I.C.I. made profits on home and export business taken together. The rate was reduced to 4½ per cent. in 1955–56, to 4 per cent. in 1956–57 and to 3 per cent. the next year; in the first of these years I.C.I. again made a profit but incurred losses in each of the next two years. The current agreement provides that the financial arrangements of the agency shall be reviewed every four years; but this has been done annually in recent years.

no members outside the United Kingdom. The original number of members was 390 ; but over the years the number was decreased considerably, mainly as a result of concentration of ownership of by-product works through nationalisation. In 1957 the National Coal Board and the Area Gas Boards produced about 40 per cent. of the total output of by-product members of the Federation. At June, 1958, the membership was 35 (34 by-product members—one of whom was not producing—and one synthetic producer), whose aggregate output represented over 90 per cent. of the United Kingdom's production of ammonium sulphate.

164. The policy-forming body responsible for the conduct of the Federation's affairs is the Council, which represents the various sources of production in eight districts which cover the whole of the United Kingdom. The Council consists of twenty-eight members, including the Chairman and two Vice-Chairmen, all of whom are appointed annually. The Council appoints from its members an Executive Committee which is responsible to the Council for the general conduct of the Federation's affairs and is empowered to appoint a small committee from among its members, known as the Finance Committee, to which the officers of the Federation may refer matters requiring prompt decision. I.C.I. is always represented on the Council and both committees.

165. The Federation is represented on the Joint Standing Committee of the Fertiliser Trade Associations by its sole selling agent, I.C.I. The Chairman of the Federation usually attends any meeting held between the representatives of I.C.I. and the National Farmers' Union when any change in the price of ammonium sulphate is to be made. He is a member of the Council of the National Sulphuric Acid Association Ltd., and the Federation is an affiliated member of the Association of British Chemical Manufacturers.

V. Research and Advisory Services of I.C.I., S.A.I. and the B.S.A.F.

166. When Brunner Mond & Co. Ltd. took over the Billingham site in 1919 it established a research department. In 1957 the department had a graduate staff of 200, nearly one-third working directly or indirectly on fertiliser production problems. I.C.I. has devoted considerable attention to research with the objects of increasing the efficiency of production from its fertiliser plants and from other plants associated with them, of improving its fertiliser products, of developing the use of nitrogen in the United Kingdom and elsewhere in the world and of educating farmers in the best methods of using fertilisers. Much effort has been devoted to the use of nitrogen on grassland and for arable crops. Research effort as a whole has for a number of years been fairly equally divided between the devising of methods of improving existing plant and the development of new products and processes, though the former activity has priority. A large volume of background research is also carried out to obtain fundamental data.

167. In 1928 I.C.I. set up an experimental farm and research unit at Jealott's Hill, near Maidenhead. The stated aim of the unit is " the long-term prosperity of agriculture, irrespective of the immediate interests of the Company, since in the long run both are identical ". It publishes its results freely. Its main effort today is directed towards crop production in

the United Kingdom. The Central Agricultural Control of I.C.I. (see paragraph 141) is responsible for Jealott's Hill. For experimental purposes I.C.I. farms 4,500 acres, divided into 8 units—7 in England and 1 in Scotland. I.C.I. provides an agricultural advisory service, staffed by qualified technicians and backed by the resources of Jealott's Hill and Central Agricultural Control. The service forms part of the Sales Organisation and covers the whole of the United Kingdom (except Scotland, where S.A.I. is responsible). Amongst other activities, it keeps contact with agricultural merchants and farmers, gives lectures, shows films and gives farm demonstrations, carries out field experiments and keeps in touch with the National Agricultural Advisory Service, the Universities, Agricultural Colleges and other interested bodies. Both I.C.I. and S.A.I. keep full cost records of a number of farms.

168. S.A.I. maintains its own staff of qualified agricultural scientists, whose duty is to provide technical service to customers in relation to the products the company sells and to advise on problems of agricultural production. Their work includes practical demonstrations, field trials and scientific experiments and contact is maintained with agricultural colleges and research institutes. For the purpose of demonstration S.A.I. makes much use of I.C.I.'s experimental farm at The Leaths, near Castle Douglas. Since the formation of S.A.I., I.C.I. has made its technical information on matters of mutual interest freely available to S.A.I., and in recent years there has been reciprocal exchange of information.

169. The B.S.A.F. also conducts some research of its own. Before the war difficulty was experienced in disposing of by-product supplies of ammonium sulphate on account of lack of uniformity in the size of crystals and colour of the material. I.C.I. took the leading part in investigating these defects, and in 1937 it was agreed that research should continue with the object of improving the quality of ammonium sulphate and that each member of the Federation (including I.C.I.) should bear a share of the cost pro rata to production. In 1945, the B.S.A.F. decided to maintain a small research station of its own. A technical committee was formed ; this meets at regular intervals to discuss the reports issued by the research station and other technical matters. Visits are made to members' works to assist and advise on difficulties which may arise on new or existing plant, and experiments are conducted under actual plant conditions.

VI. Association Membership

170. I.C.I. is a member of the British Sulphate of Ammonia Federation Ltd. (B.S.A.F.), the Fertiliser Manufacturers' Association Ltd. (F.M.A.), The National Association of Corn and Agricultural Merchants Ltd. (N.A.C.A.M.), and the National Farmers' Union (N.F.U.) S.A.I. is a member of the F.M.A., the Superphosphate Manufacturers' Association Ltd. (S.M.A.), the International Superphosphate Manufacturers' Association, the Basic Slag Producers Association (B.S.P.A.), and the N.A.C.A.M. As stated in paragraph 165 the B.S.A.F. is represented on the Joint Standing Committee of the Fertiliser Trade Associations by its sole selling agent, I.C.I.